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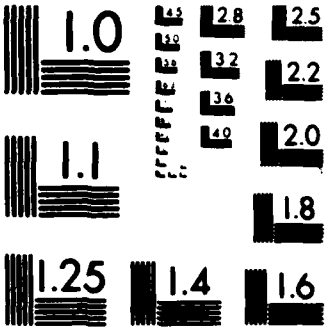

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FOREIGN TECHNOLOGY DIVISION

POLYVINYL ESTERS OF ω-H-PERFLUOROACIDS AND POLYVINYL ALCOHOL OBTAINED FROM THEM

by

Ye. N. Rostovskiy, L.D. Budovskaya, et al.

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HUMAN TRANSLATION

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В в	*В в*	V, v	Т т	*Т т*	T, t
Г г	*Г г*	G, g	У у	*У у*	U, u
Д д	*Д д*	D, d	Ф ф	*Ф ф*	F, f
Е е	*Е е*	Ye, ye; E, e*	Х х	*Х х*	Kh, kh
Ж ж	*Ж ж*	Zh, zh	Ц ц	*Ц ц*	Ts, ts
З з	*З з*	Z, z	Ч ч	*Ч ч*	Ch, ch
И и	*И и*	I, i	Ш ш	*Ш ш*	Sh, sh
Й й	*Й й*	Y, y	Щ щ	*Щ щ*	Shch, shch
К к	*К к*	K, k	Ъ ъ	*Ъ ъ*	"
Л л	*Л л*	L, l	Ы ы	*Ы ы*	Y, y
М м	*М м*	M, m	Ь ь	*Ь ь*	'
Н н	*Н н*	N, n	Э э	*Э э*	E, e
О о	*О о*	O, o	Ю ю	*Ю ю*	Yu, yu
П п	*П п*	P, p	Я я	*Я я*	Ya, ya

*ye initially, after vowels, and after ъ, ь; e elsewhere.
When written as ё in Russian, transliterate as yё or ё.

RUSSIAN AND ENGLISH TRIGONOMETRIC FUNCTIONS

Russian	English	Russian	English	Russian	English
sin	sin	sh	sinh	arc sh	$\sinh^{-1}$
cos	cos	ch	cosh	arc ch	$\cosh^{-1}$
tg	tan	th	tanh	arc th	$\tanh^{-1}$
ctg	cot	cth	coth	arc cth	$\coth^{-1}$
sec	sec	sch	sech	arc sch	sech^{-1}
cosec	csc	csch	csch	arc csch	csch^{-1}

Russian	English
rot	curl
lg	log

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POLYVINYL ESTERS OF ω-H-PERFLUOROACIDS AND POLYVINYL ALCOHOL OBTAINED FROM THEM

Ye.N. Rostovskiy, L.D. Budovskaya,
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[Submitted 4 Jul 86

Esteemed Editor,

By means of radical polymerization at 20° we obtained polyvinyl esters of ω-H-perfluoroacids from monomers

$$CH_2=CHOC(=O)-(CF_2-CF_2)_2H \text{ and } CH_2=CHOC(=O)-(CF_2-CH_2)_2H.$$

The product of their saponification - polyvinyl alcohol (PVA) - differs significantly from PVA which is obtained by other methods (mainly with respect to its exceptionally high water resistance). It contains 0-0.25% glycol groups (based on oxidation of periodic acid). When heated higher than the glass transition temperature T_c^n=90° it is crystallized rapidly, and it has a melting point T_n^n=236° (determined dilatometrically) and increased density d_{20}^n=1.315 g/cm^3. There are no cross bonds in PVA; a melt of it is fluid. PVA dissolves in aliphatic multiatomic alcohols and amines. In water it is dissolved only at a temperature higher than 150° (under pressure). In the IR spectra of PVA a band of absorption of increased intensity was detected at 916 cm^{-1}. This is characteristic for a syndiotactic structure.

For proof of the syndiotactic structure of the PVA which was obtained from polyfluorovinyl esters we made (following the data in the literature [2, 3]) an X-ray diffraction study of polyvinylformates (PVF), obtained both from the standard and from our PVA.

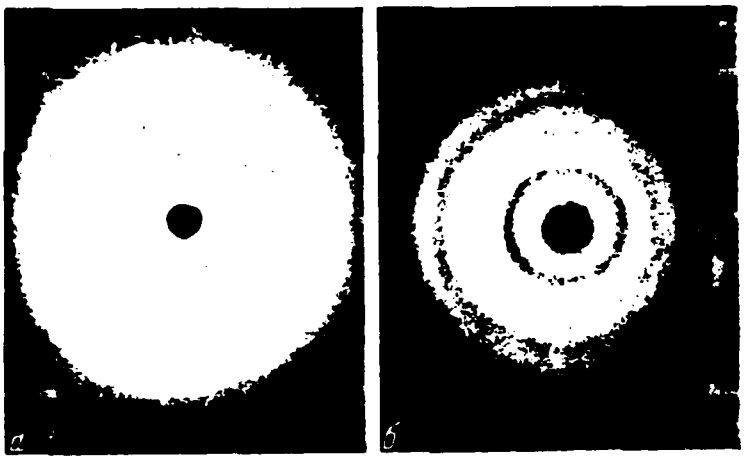
While the PVF from the standard PVA was amorphous (Fig. a), the PVF from the investigated PVA turned out to be a crystalline polymer (Fig. b). The X-ray diffraction characteristics of the PVF synthesized by us were the following:

Angle of diffraction 2θ°	13°30'	19°57'*	26°36'	34°32'*
Interplanar distance, Å	6.50	4.44	3.34	2.60

* Weak lines

It is known [3] that d=6.50 Å and d=3.34 Å are characteristic for syndiotactic PVF. They differ significantly from isotactic PVF, for which the most intensive line 2θ=22°40' (d=3.90).

Thus it can be concluded that the special features of the properties of PVA, obtained by saponification of polyvinyl esters of ω-H-perfluoroacids are conditioned by the regular syndiotactic structure both of the PVA itself and of the initial polyperfluorovinyl esters.



а б

Figure 1. Debye crystallogram in the study [sic] of CuK_{α}, monochromatized by N_i, distance of 40 m [sic]. Polyvinylformate, obtained by esterification:
а - standard polyvinyl alcohol, b - polyvinyl alcohol, synthesized from $-CHOC(CF_2-CF_2)_3H$ (O)

References

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2. K. Fujii, T. Mochizuki, J.High Polymer (Japan), 19, 124, 1962.
3. K. Fuzhi, T. Moshizuki, Khimiya i tekhnol. polimerov (Chemistry and technology of polymers), 1963, No 1, 72.

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